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Reserve 196 R31Fs mo

Felleral State Cooperative

Finous Surveys and Water Supply Foresasts

for

Montana and Northern Wyoming
Upper Missouri,
Upper Columbia and

Yellowstone Rivers

Division of Irrigation Soil Conservation Service

United States Department of Agriculture

AND

Montana Agricultural Experiment Station

In cooperation with the U. S.Forest Service, U. S. Geological Survey, National Park Service, U.S. Bureau of Reclamation, State Engineers of Montana and Wyoming and other Federal, State and local organizations.

-AS CF

APR. 1, 1954

UNITED STATES DEPARTMENT OF ACRICULTURE, SOIL CONSERVATION SERVICE.

TO RECIPIENTS OF COOPERATIVE SNOT SURVEY A 1D WATER SUPPLY FORECAST REPORTS

Forecasts by U. S. Weather Bureau of total anneal strong from U. of September, inclusive, at more than 300 gaging stations are issued morely by J. mary through May in the publication WATER SUPPLY FORES. T FOR THE WISTERN UNITED STATES

We ther Bureau forecasts of runoff presented in that bulletin are computed from procedures based on mathematical analysis of the bulletin between precipitation and cunoff.

The Weather Bureau bulletins may be secured by writing to.

Hydrology I in Charge River Forecast Center U. S. Wenther Bureau 712 Federal Office Building Kan as City 6, Mis ouri

For current information on local river and flood conditions, reference should be made to the appropriate River District Office, lieted below:

Meteorologist in Charge.......Missouri River and Weather Bureau Office tributaries above Box 1705 Fort Peck Dam; Milk Helena, Mont. River

Meteorologist in Charge................Yellowetone River Weather Sureau A'rport Station and tribitaries. Box 1338
Billings, Mont.

True of Minima

FEDERAL - STATE COOPERATIVE SNOW SURVEYS AND WATER SUPPLY FORECASTS

FOR
MONTANA AND NORTHERN WYOMING

(Upper Missouri and Upper Columbia River Basins)

Report issued by:

Truman C. Anderson
State Conservationist
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M. M. Kelso
Director, Montana
Agricultural Experiment Station

Report Prepared by:

A. R. Codd
Hydraulic Engineer
Soil Conservation Service

and

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Irrigation Engineer
Montana Agricultural Experiment Station

Soil Conservation Service
U. S. Department of Agriculture
and
Montana Agricultural Experiment Station
Bozeman, Montana



WATER SUPPLY OUTLOOK FOR SEASON 1954 AS OF APRIL 1, 1954

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JEFFERSON RIVER:

April 1 snow surveys on the upper tributaries on the Jefferson River in Beaverhead County show a slightly below average water content this season. It is estimated that the Beaverhead River at Barratts will flow 171,000 acre feet of water from April through September, or 84% average. The Big Hole River near Melrose will flow approximately 674,000 acre feet, or 82% average, with the Jefferson River at Sappington producing 1,058,000 acre feet during the irrigation season.

MADISON RIVER:

The snow-pack this season on the Madison River is very close to average and should produce a fair water supply from April through September.

GALLATIN RIVER:

The 1954 snow-pack over the Gallatin River is slightly higher than the other two rivers that make up the Missouri. It is anticipated that the snow-pack will produce approximately 529,000 acre feet of water from April through September, or 105% average. The peak discharge of the Gallatin River at Gateway should be approximately 1,690 sec. ft. More reliable data on this peak discharge and subsequent discharges during May and June will be released at a later date.



GALLATIN RIVER (continued)

Middlecreek (Hyalite): The snow cover on this basin is roughly 103% average and it is anticipated that the seasonal flow from April through September will be 33,700 acre feet of water or 91% average, with a peak discharge in the neighborhood of 331,000 acre feet of water. More information will be released at a later date relative to the estimated size of the peak discharge and subsequent sec. ft. flow figures during May, June and July.

MISSOURI RIVER MAIN STEM:

The Missouri River Main Stem from Toston to Fort Benton, which covers several tributaries, has a snow-pack average slightly above average, while the water supply forecasts for the several stations in this reach of the river indicate a slightly below average runoff which is a natural conclusion in this section of the river. The Sun, Teton and Marias Rivers have an exceptionally high snow-pack. On the Sun River alone, the snow-pack is the greatest on record for the past 15 years.

At the Goat Mountain snow survey course, which is measured by the U. S. Geological Survey, the snow is 57" deep with 18" of water content. The 15 year average water content on this snow survey course is 10.3 inches.

At Benchmark Ranger Station, the snow is 48" deep with 17.5" of snow. When this record is compared with the six year average of 10.9" of water, the conclusion is reached that there is going to be an exceptionally high runoff from the snow-pack this season on the Sun River. Converting these snow survey figures into stream-flow runoff for the April-September period, the Sun River at Vaughn should flow 591,000 acre feet of water for the period, or 131% average.

The Marias River and the Teton River have equally high snow cover and the runoff from snow feeding these streams should be dangerously high this season. There is a potential flood hazard existing on these three streams this season.

UPPER YELLOWSTONE:

The snow cover on the Upper Yellowstone River through Montana should produce a fair water supply this season. There is more snow in the mountains this season that last season, but not as much as 1952. The Yellowstone River at Corwin Springs should produce 1,900,000 acre feet of water from April through September or 97% average. This figure is slightly higher than last year. Other downstream stations should indicate approximately the same percentage. The Clark Fork River of the Yellowstone will flow considerably less in percentage than other tributary basins. Snow survey figures indicate that this stream will flow 512,000 acre feet of water from April through September or 83% average.



COLUMBIA RIVER BASIN IN MONTANA:

The snow-pack for 1954 on the Columbia River Basin is in general about 10% above average. The snow which covers the Kootenai River Basin in Northwest Montana and also in British Columbia is a record high this year. Although the Kootenai River is well confined in its river gorge through most of Montana, the flow in June and July is going to be exceptionally high and low water installations should be guarded carefully and preparations made to move them in the event of dangerously high water. There is a definite flood potential for downstream localities in the vicinity of Bonner's Ferry, Idaho.

Flathead - The snow-pack which covers the upper tributary basin of the Upper Flathead River this season is considerably higher than 1953 and slightly higher than 1952, averaging 115% of 18 years record. The North Fork will discharge approximately 133% average. The Middle Fork will flow approximately 125% of average. The South Fork is estimated to flow 2,710,000 acre feet at Hungry Horse Dam during the period April-September. This figure is the observed flow plus or minus the storage in the reservoir. The Flathead River at Polson will probably flow 124% average. The snow-pack this season should produce a very good water supply in all reaches of the river.

Clark Fork River: - The Upper Clark Fork Basin above Missoula is short of snow this season and about the same as last year. The April-September flow will probably reach 771,000 acre feet or 90% average. The Blackfoot River which enters the Clark Fork above Missoula will flow approximately 113% average which will help materially to boost the flow of the Clark Fork River above Missoula to 102%. The Bitterroot River is in fair shape as the 1954 snow-pack is 114% average. At St. Regis, the Clark Fork will flow 4,628,000 acre feet, or 104% average for the April-September period. The Flathead River with its above normal anticipated flow will raise the Clark Fork River at Cabinet Gorge as it leaves Montana to 116% average or 15,594,000 acre feet for the April-September period.



U. S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE

INDEX TO MONTANA & NORTHERN WYOMING SNOW COURSES

IND		TO	Loca	JIV ation				DRTHE	RN WYC			Lo	○ V\		.Ou	RSES	
rainage Basin nd Course Name	MISSO	<u>⊡ev.</u> DURI	Sec. Lat. RIVER	Two.	Range Long.	Record Began	Feasuring Dates ^a	Ecasured By:	Prainage Basin and Course Name	Number SSOUR	Elev.	Sec. Lat.	Dep.	Range Long,	Record Began	Dates	Heasur By:
(ROCK-SEAVERHEAD)									SIG NORN RIVER Wy	oming							
skeview Ridge skeview Canyon Linekiln hite Pine Ridge (NORSE PRAIRIE)	1153 1154 1252 1261	740 0 6930 6950 8850	27 26 5 18	148 148 158 148	24 24 9W 9W	1948 1948 1948 1948	3,4,5 3,4,5 3,4 3,4	9 9 1 1	Seavers Mill Owl Creek Tensloop R.S. Timber Croek Ranger Creek	9F8 8F1 7E3 9E2 7E1	8900 8700 8300 8800 8800	6 36 30 25 32	43N 43N 49N 47N 53N	102W 101W 86W 103W 88W	1948 1948 1935 1948 1935	2,3,4,5 2,3,4,5 4,5 4,5	12 12 1 12 12
oody Dick ld Stone mhi Pase rrell Creek ail Creek	13010 1309 1351 13012 1362 1362	7600 8100 7480 6650 7090 6800	12 11 9 14 15 27	85 85 105 95 105 85	16W 16W 15W 15W 15W	1948 1948 1948 1948 1948	3,4 3,4 3,4 3,4 3,4	1 1 1 1 1 1 1	Wood River (SHOSNONE RIVER) We Sast Entrance Sylvan Paes	1086 1085	7000 7100	28 17 12	52N 52N	109W 110W	1939 1948 1936	1,2,3,4,5 1,2,3,4,5	5 5
(BIG NOLE) g Hole Pace g Nole Pacs (Belo	1303	7440 6900	28 24	3S 3S	18W	1948 1948	3,4 3,4	1 1	8ig Goose Burgess Ranger Sta Dome Lake Lodgepole	7E2	7700 7900 8800 8200	4 36 11 32	53N 56N 53N 56N	B6W 89W 87W 106W	19L5 1950 1950 1940	2,3,4,5 2,3,4,5 2,3,4,5 4.5	1 12 12
st Boundary boons Paes unke Creek ner Forks ner Lake	1305 1302 1306 1306 1307	6700 7100 7340 7300 6720	22 4 25 24 10	3S 2S 7S 6S 6S	17W 19W 16W 17W 16W	1948 1934 1948 1948 1945	3,4 1,2,3,4,5 3,4 3,4 3,4,5	1 1,2 1 1	POWDER FIVER Rorth Powder Muddy Pass Soldier Park	758 767 756	8500 9700 8700	5 11 36	47N 48N 51N	85W 85W 85W	1951 1950 1950	2,3,4,5 2,3,4,5 2,3,4,5	12 1 12
(WISE RIVER) iereon Mdw. c Norn ee River	13 8 14 13015 13013	7000 8450 6300	18 15 15	35 48 25	12W 12W 12W	1948 1934 1948	3,4 3,4,5 3,4	1 2 1	Sour Dough Red Fork	651 761	85 00 7000	17 18	49N 43N	84W 85W	1936 1 9 36	2,3,4,5	1 12
(RUBY RIVER)																	
ttonwood ttonwood (Upper) ashlight bacco Root gilante	1162 1161 1203 1202 1101	5900 8400 6950 6900 6125	24 30 22 13 28	10S 10S 8S 4S 9S	3W 2W 4W 4W 3W	1948 1948 1945 1948 1948	3,4 3,4,5 3,4,5 3,4 3,4	1 1 1 1	KOOTENAI RIVER		COLUM	ИВІА	RIV	ER B	ASIN		
OISON RIVER bgen st Yellowetone rris Baein	1185 1187 1082	6550 6700 7500	22 34 44 - 44.*	11S 13S	3E 5B 110°-42'	1934 1934 1935	1,2,3,4,5 1,2,3,4,5 3,4	2 2 5,6	Baree Mountain Blue Bird Basin Red Mountain FLATHEAO RIVER	1581 14A1 15A1	6000 6800 6000	1 24 4	25N 37N 36N	31 W 26W 29W	1937 1937 1937	4,5 4,5 3,4,5	1 1 1
LLATIN RIVER vil'e Slide od Meadow stic Lake mw World -Mile	1004 1003 1002 1001 11E6	EL 00 6600 6600 6700 7150	14, 22 30 24	55 43 35 38	6E 6E 7E 6E 5E	1935 1934 1935 1939 1934	2.3,6,5 2,3,6,5 2,3,4 1,2,3,4,5 1,2,3,4,5	2,6 2,6 6,7 6,7	Basin Creek Big Creek Brush Creek Cattle Queen Desert Mouhtain RallRoaring Divide Holbrook	13814 1383 1444 1341 1342 1443 13813	5000 6750 5000 4700 5600 5770 4530	11 6&7 13 7 24 35 18	19N 22N 30N 35N 31N 32N 21N	12W 18W 26W 17W 19W 2ZW 13W	1951 1941 1937 1939 1937 1942 1951	2,3,4,5 3,4,5 3,4,5 3,4,5 1,2,3,4,5 3,4,5 1,2,3,4,5	1 4 1 5 1 1
SSOURI RIVER MAIN sesman Reservoir yatal Lake asshopper nge Hill cnic Grounds pestons Pase myle Pase m Hile Creek, Low n Hile Creek, Midde n Hile Creek, Wippe	12C5 9C1 10C2 10C1 12C6 12D1 12C1 er12C2 hul2C3	6200 6100 7000 7950 6500 7200 6900 6250 6800 8000	2 24 19 35 22 11 16 13 13	8N 12N 9N 13N 5N 1N 13N 8N 8N 8N	5W 17E 8E 7E 6W 7W 7W 6W 6W 5W	1936 1941 1938 1937 1940 1938 1934 1935 1934	1,2,3,4,5 3,4 3,4,5 2,3,4,5 3,4,5 1,2,3,4,5 1,2,3,4,5 1,2,3,4,5	2 1 1 2 3 1 2 2 2 2 2 2	Kishenchn Limestone Pase Logan Creek Marias Pass Snow Lab. 716 Spotted Sear Mt. Strawborry Lake Trinkus Lake Trout Lake 72 Upper Nolland Lake Twin Creeks Quintonkon Coyote Rill El Dorado Nine	1442 1388 1445 1345 1349 1382 13410 1381 13412 1385 1385 13811 15413	4300 4300 4300 5250 5250 7000 6500 6500 3600 7000 3580 3800 4200 7800	7 28 34 15 23 11 9 21 28 14 11 12 23	37N 18N 30N 30N 29N 25N 28N 25N 26N 26N 26N 18N 8N	21W 12W 24W 14W 15W 17W 17W 16W 16W 16W 12W	1946 1948 1937 1934 1946 1948 1948 1948 1948 1948 1951 1951 1951	4,5 3,4,5 1,2,3,4,5 1,2,3,4,5 3,4,5 3,4,5 3,4,5 3,4,5 2,3,4,5 2,3,4,5	1 1 2 2 1 1 1 1 1 1
TON RIVER) eight Creek ldron Creek st Fork	12A1 12B2 12B1	6000 5600 6000	13 16 6	26N 25N 25N	10W 9W 9W	1948 1948 1948	3,4 3,4 3,4	1 1 1	Gold Creek Lake Intergeerd Lubrecht Forest North Fork Joeko Pionio Grounds Pipeetone Pase	1308 1304 1308 1387 1206	7200 6150 5100 6330 6500 7200	14 6 31 3 22	8N 5H 14N 17N 5N	12m 13m 15m 15m 17m 6m 7m	1916 1939 1951 1911 1910 1938	1,2,3,4,5 1,2,3,4,5 3,4,5 2,3,4 2,3,4,5	11 3 13 4
UN RIVER) nch Mark bin Creek Bull tee Park at Mountain Lake ong Creek Ridge	1288 1286 1289 1285 1287 1389 1283	5500 5400 5600 5300 7000 7300 6800	9 33 36 31 20 21	20N 23N 20N 24N 22N 23N 25N	10W 10W 10W 10W 10W 12W 10W	1948 1949 1948 1949 1934 1950 1949	3,4 3,4 3,4 3,4 3,4 3,4	1 1 1 2 1	Reiny Lake Slide Rock Mountel; Southern Crose Stemple Pess Storn Lake No. 2 Stuert Mill Stuert Mountain #1	1386 n 1302 1305 1301 1307 1306	1300 7100 6500 6900 7780 6500 7100	11 26 9 16 19 19	18N 10N 5N 13N LN 5N 1LN	16m 16m 13m 7m 13m 13m 13m	1947 1937 1939 1934 1939 1939 1936	3,4,5 4 2,3,4 3,4,5 2,3,4 2,3,4	1 1 3 2 1 3 1
ong Creek ARIAS RIVER) riam Paco	1284 13A5	5700 5250	32	25N	10W	1949	1,2,3,4,5	2	Saree Vountain Freezeout Submit #6	1381 2 15810 1501	6000 6800 6200	1 21 9&16	25 N 15 N 1 L N	31m 27m 27m	1937 1951 1937	4.5 4	1 1 1
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USSELSHELL RIVER)	1003	7000	19	9N	8E	1938	3,4	1	Mud Creek Pesture Nez Perce Camp Nezperce Pese Skalkaho Summit	14c1 14p2 14p1 13c3	1500 5580 6575 7259	21, 19420 32 30	11N 1S 26N 6N	2LW 23W 16E 17W	1937 1937 1937 1937	3 4 4 4	1 1 1
amp Senia anyon ooke City revice Mt. noependence ake Camp upine Creek	901 1053 1007 1005 1006 1054 1061	7890 7750 7400 8400 8000 7850 7300	2 44°-44° 25 29 22 44°-34° 44°-54°	98 99 78 1	18E 110°-30' 14E 9E 12E 10°-24' 10°-37'	1937 1938 1937 1935 1941 1937 1938	1,2,3,4,5 1,2,3,4,5 3,4 3,4 1,2,3,4,5 1,2,3,4,5	1 12 5 1 12 12 5		SASKA	ATCHEV	WAN	RIV	ER B	ASIN		
SHISLDS RIVER) orcupine OWER TELLOWSTONE	1003	6500	10	4N	108	1938	3,4	1	ST. WARY RIVER Toeberg Lake Piegen Paes #4 Piegen Paes #0 Mount Ailen #7	13A3 13A4 13A6	5000 L	80-14, 80-16, 80-16,	1	130-121 130-101 130-121	1922 1922 1922	5 5 5	2,8 2,8 2,8
wind River) Myomirooks Lake #3 Irroughe Creek Irroughe Creek Irroughe Creek Irroughe Creek Noir Syser Creek babe Park Ittle Warm sequito Park R.S. eridan R.S. Lawrence R.S. Croes Ranch rout Creek gwotes Pass Popo Agte River)	10P2 9P6 9F10 9F9 9P2 9P3 9C2 9F4 9C3 9F1 9F11 9F5 9C1 10F1 Wyoming	9200 8800 10000 9500 8750 8500 10000 9500 7500 9000 8000 8400	23 15 9 34 27 12 22 24 23 3 26 1 5 9	44N 43N 39h 4N 42N 41N 2S 41N 2S 42N 1N 2S 42N 1N 43N 2S 44N	110W 107W 105W 6W 108W 108W 3W 108W 3W 109W 4W 107W 2W 110W	1939 1948 1948 1948 1940 1948 1948 1948 1940 1940 1940 1940 1948 1936	2,3,4,5 2,3,4,5 2,3,4,5 2,3,4,5 2,3,4,5 2,3,4,5 2,3,4,5 2,3,4,5 2,3,4,5 2,3,4,5 2,3,4,5 2,3,4,5 2,3,4,5 2,3,4,5 2,3,4,5	12 12 12 12 12 12 12 12 12 12 12 12 12 1	s. Numerals 1,2,3,6 b. Numerals 1,2,3,6 b. Numerals refer 1. U. 2. O. 3. W 4. U. 5. Nu 6. M 7. C!	s. Fores. S. Geoldontene Po.S. India etionel I	5800 L	Januar Januar ourse t vey and ny	y 1, Fe	brus ry 1	es follow		2,8 2,8
ue Ridge cannier Feadewe ursen Creek wmill Clade outh Paes	8C2 8C4 9C4 8C1 8C3	9500 9000 9000 8500 9000	23 19 12 3 13	31 N 30 N 30 N 31 N 30 N	101W 100W 103W 101W 101W	1939 1936 1948 1939 1939	2,3,4,5 2,3,4,5 3,4,5 2,3,4,5 2,3,4,5	12 12 12 12 12	9. U. 10. 0. 11. 0. 12. Sc	S. Fish S. Bure erlodge oll Cons	end Wildle end Wildle ou of Reol Citizens ervation Se tete Force	ife Ser metion Committ ervice	v10 e	200 0 6 E.	and and an analysis of	P	5,R-11,

APRIL 1, 1954 FORECAST OF SEASONAL STREAM FLOW

	Seasonal Stream Flow in Thousands of acre feet								
UPPER MISSOURI RIVER	FORECAST 1954	%	Measured		10-Yr.				
IN MONTANA	April	10-yr.			Avg.				
	Sept.	Avg.	1952	1953	1942-51				
RED ROCK RIVER			Panal de la constant						
Monida (near) (1)	85	97	69		87				
Kennedy Ranch (at)									
BEAVERHEAD RIVER									
Barratts, Montana	171	84	222		203				
GIG HOLE RIVER		0							
Melrose (near)	674	82	808		821				
JEFFERSON RIVER									
Sappington (at)	994	84	1135		1185				
MADISON RIVER									
West Yellowstone (near)	200	96	248	207	208				
Garyling (near) (2)	423	94	563		445				
McAllister (near) (3)	746	99	962		756				
GALLAT IN RIVER									
Gateway (near)	492	106	596	404	465				
Logan (at)	557	100	745	442	506				
MISSOURI RIVER					040				
Toston (at)	2192	90	2825		2427				
Fort Benton (at) (5)	3627	96	3882		3767				
Loma (5)	4448	98	4562		4542				
Zortman	4856	98	5115		4920				
Ft. Peck Dam (below) (5)	4790	98	5188		4852				
Wolf Point (near) (5)			7015		5150				
Williston, N.D. (nr.) (5)									
Bismark, N.D. (at) (5) SUN RIVER									
	۳۵۶	202	312		451				
Vaughn (at) (4) MARIAS RIVER	591	131	312		491				
Shelby (at)	//5	7.00							
Brinkman (near)	667	122	533	628					
JUDITH RIVER	578	108	555	020					
	50	7.00	48	38	46				
YELLOWSTONE RIVER	50	109	40	30	40				
Corwin Springs (at)	1000	07	2171	1600	1957				
Livingston (near)	1900	97	2408	1000	2267				
Billings (at)	2192	90	4642		4344				
Miles City (at)	39 1 3 6782	97	6265		7024				
Sidney (near)	7094	98	6857		7266				
SHIELDS RIVER	1074	70	0001						
Wilsall (near)	45	100	50		45				
Clyde Park (at)	110	93	162		118				
CLARK FORK RIVER									
Chance(at)	512	83	576		617				
Edgar (at)	277	82	613		657				
Hyalite Crk R. S. (at) (6)	33.7	91	41		37				

⁽¹⁾ Observed flow plus change in storage in Lima Reservoir

⁽²⁾ Observed flow plus change in storage in Hebgen Lake

⁽³⁾ Observed flow plus change in storage in Hebgen & Ennis Lakes

⁽⁴⁾ Observed flow plus change in storage in Gibson, Willow Crk and Pishkun Res.

⁽⁵⁾ Observed flow plus change in storage in Canyon Ferry & Ft. Peck Reservoirs (6) Observed flow plus change in storage in Hyalite Reservoir

^{*} Preliminary data furnished by U.S. Geological Survey subject to revision



FORECAST OF SEASONAL STREAM FLOW

MISSOURI RIVER BASIN	Seasonal Stream	n Flow i	n Thousan	ds of ac	re feet
YELLOWSTONE RIVER TRIBUTARIES	FORECAST 1954	%	Measured	runoff	10-Yr.
in WYOMING	April	10-yr.	April -	Sept.*	Avg.
	Sept.	Avg.	1952	1953	1942-51
Ways David					
WIND RIVER		_,	1		
Riverton (at) (6)	690	124	354		556
BIG HORN RIVER			1		
Thermopolis (at) (7)	1150	110	374		1046
Kane (at)	1580	106	767		1490
St. Xavier (near (8)	2320	102	1286		2769
BULL LAKE CREEK					
Bull Lake (Above)	180	89	214		202
Lenor (near)	170	117			145
POPO AGIE RIVER					
Riverton (near)	457	119	450		383
NORTH FORK POPO AGIE RIVER					
Lander (near) (9)	84	109	92		77
LITTLE POPO AGIE RIVER					
Hudson (at)	78	137_	81		57
GREYBULL RIVER					
Meeteetse (at)	244	103	278		237
Basin (near)	116	103	173		113
SHOSHONE RIVER			·		
Buffalo Bill Dam (below)(10)	861	107	697		806
Byron (at) (10)	624 -	100	186		627
TONGUE RIVER					1
Dayton (near)	122	104	104		117
Acme (near)	296	108	239		274
Decker (near) Mont. (11)	305	110	249		277
POWDER RIVER					
Arvado (at)	168	118	125		142
Moorehead (at) Montana	293	103	235		282
Locate (at) Montana	353	100	303		353 _
MIDDLE FORK POWDER RIVER					
Kaycee (near)	75	104	36		72
NORTH FORK POWDER RIVER				The state of the s	
Mayoworth (near)	19	100	17		19
CLEAR CREEK		100		ř-	17
Buffalo (near)	36	92	35		39
Arvado (near)	109	87	100		126
	10)	1 01	100		120

⁽⁶⁾ Observed flow plus storage in Bull Lake and Pilot Butte Reservoirs

Observed flow plus storage in Boysen Reservoir

⁽⁸⁾ Observed flow plus storage in Boysen and Buffalo Bill Reservoirs
(9) Observed flow plus storage in Bull Lake Reservoir
(10) Observed flow plus storage in Buffalo Bill Reservoir

⁽¹¹⁾ Observed flow plus storage in Tongue Reservoir

^(*) Preliminary data furnished by U. S. Geological Survey subject to revision



APRIL 1, 1954

FORECAST OF SEASONAL STREAM FLOW

	Seasonal Stream	m Flow in	Thousand	s of acr	e feet
UPPER COLUMBIA RIVER	FORECAST 1954	%	Measured		10-Yr.
IN MONTANA	April	10-Yr.	April -	Sept.*	Avg. 1942-51
	Sept.	Avg.	1952	1955	1942-01
CLARK FORK RIVER					
Bonner (above) (3)	771	90	833		855
Missoula (above)	1,844	102	1782		1809
Missoula (below)	3,452	104	3268		3334
St. Regis (at)	4,628	104	4318		4430
Plains (near) (4)	13,718	115	11551		11950
Cabinet Gorge (at) (4)	15,594	116	13000 15501	15706	13370 16067
Z-Canyon (below) (8)	18,099	113	15501	15/00	10001
BLACKFOOT RIVER					
Bonner (near)	1,073	113	948		944
BITTERROOT RIVER					
Darby (near)	622	107	608		582
At Mouth (6)	1,525	105	1486		1525
FLATHEAD RIVER					
Columbia Falls (near) N.Fk.	2,464	133			1851
Columbia Falls (at)(7)	7,543	125	5733	4924	6040
Polson (near) (4)	8,747	124	7034	7590	7051
	-,1-1			127	1.77
MIDDLEFORK FLATHEAD RIVER					
West Glacier (near)	2,232	125	1682	2156	1791
ACCURATE DADY BY ABOVE A PRINCE					
SOUTH FORK FLATHEAD RIVER	0.530	700	2065	2200	201.7
Columbia Falls (near) (7)	2,710	120	2067	2290	2247
PRIEST RIVER					
Priest River (near)	1,038	113	8614	880	915
SWAN RIVER					
Big Fork (at) (3) Difference in observed fl	682	114			595

(3) Difference in observed flow, Clark Fork above Missoula & Blackfoot at Bonner (4) Observed flow plus change in storage in Flathead Lake & Hungry Horse Reservoir

(6) Difference in observed flow, Clark Fork above and below Missoula (7) Observed flow plus change in storage in Hungry Horse Reservoir

(8) Observed flow plus change in storage in Hungry Horse, Flathead & Pend Oreille Lk

(*) Preliminary data furnished by U. S. Geological Survey, subject to revision



COMPARISON OF SNOW COVER WITH THAT OF PREVIOUS YEARS

Summary of Snow Survey Data by Tributary Watersheds as of April 1, 1954

January of Office Out voy Data 5,	No. of				r Equivalent
TRIBUTARY BASINS	Courses Averaged	Years			ercent of AVERAGE %
	Averaged	New Market	1900/8	1900/0	AVISITA OS
MISSOURI	RIVER BAS	IN IN MO	ANA TNO		
Nation production					
JEFFERSON	To the point of				
Rock-Beaverhead	4	6	85	67	80
Horse Prarie	6 7 3 5	6	86	88	86
Big Hole	7	6-15	89	83	95
Wise River Ruby River	2 5	6 -1 5 6 - 9	100	83 69	101 86
			1		
MADISON	6	17-18	109	63	107
GALLAT IN	5	15-17	108	70	101
MISSOURI MAIN STEM	8	15-1 8	109	93	109
Teton River	3	6	129	139	132
Sun River	3	5-15	209	136	163
Marias River	3 1 1	18	170	138	163
Milk River Musselshell		12	135	122	115
UPPER YELLOWSTONE (MONTANA)	3 7	<u>13-16</u> 12-19	134	84 86	114
(MONTALY)	•	14-17	120		
Shields River	2	15	116	76	125
LOWER YELLOWSTONE, WYOMING			1		
Shoshone	2	5 - 16	127	92	102
Wind River	14	4-18	125	106	109
Popo Agie	6	5 -1 7	168	89	136
Owl Creek on the Big Horn River		۲ م ۱	7 77	7 50	
Wood River on Greybull River Tongue River	2	5-14 3-18	178	150 151	127 149
Clear Creek on the Powder River	3 2	4-17	196	118	136
Crazy Woman Crk on Powder River	3	3-17	1.38	94	115
COLUMBIA	RIVER BAS	IN IN MO	ONTANA		
KOOTENAI RIVER, above Libby, Mont.	15	6-17	140	141	149
FLATHEAD RIVER	21	3-18	145	107	115
UPPER CLARKFORK	15	3 _ 18_	101	87	105
BITTERROOT	8	15-17	105	87	114
PEND OREILLE	5	15-17	128	130	144



STATUS OF RESERVOIR STORAGE APRIL 1, 1954

BASIN		USEABLE		OUSAND ACE	E FEET	IN STORA		
& ST REAM	RESERVOIR	CAPACITY (M.A.F.)	1954	MARCH 31 1953	1952	1951	10-yr avg	
	TOTAL TO THE STATE OF THE STATE	(mener e)	1301	1300	1005		and Company of the state of the	
MISSOURI RIVER	BASIN							
Beaverhead	Lima	84.00	118.0	41.6	35.6	48.3	40.5	
Ruby River	Ruby				005 0	070 4	004.0	
Madison Riv	Hebgen Lk	345.00	170.2	191.6	225.2	232.4	284.9	
Madison Riv	Ennis Lk	41.00	35.7	29.2	38.7	36.0	34.8	
Hyalite Crk	Missle Crk	8.03	4.2	5.0			New	
Missouri Riv	Canyon Ferry	401.70	413.6	40.1	20.5	20.9	31.5	
Missouri Riv	Hauser Lk	\		0.5	70.0	70.0	40.0	
	(Inc. Lk Hele	•	56.2	23.9	38.0	38.9	42.9	
Missouri Riv	Lk Helena	10.45	8.3	0.4	3.0	3.2	7.8**	
Missouri Riv	Holter Lk	81.92	59.1	38.9	37.6	74.4	52.9	
N.Fk.Sun Riv	Gibson	105.00	77.5	58.4	67.0	80.6	56.2	
N.Fk.Sun Riv	Willow Crk	32.30	27.0	21.4	25.5	26.0	13.1	
N.Fk.Sun Riv	Pishkun	32.00	20.5	17.5	23.0	18.9	18.4	
Teton Riv	Bynum			30.0	0==		05.0	
Birch Crk	Swift	30.00	24.8	13.6	25.3	30.0	25.0	
Dupuyer &	Lk Francis							
Birch Crk		112.00	92.3	97.9	94.1	96.5	91.1	
Judith Riv	Ackley Lk	5.82			3.7	4.9	4.5	
Missouri Riv	Ft. Peck		12,180.0	12,750.0				
Milk Riv	Fresno	127.20	86.1	85.9	147.7	99.9	71.2	
Milk Riv	Nelson	66.80	38.1	29.7	37.0	15.7	28.2	
W.Rosebud Crk	Mystic Lk	20.80	6.1	4.6	4.6	5.2	6.0	
Red Lodge Crk	Cooney	27.50		32.0	13.4	14.0	16.8	
Tongue Riv	Tongue Riv	73.90	7.1	18.0	39.1	9.0	18.6	
Swiftcurrent	Sherburne Lk	66.10		18.9	19.6	30.8	25.6	
** 9 year aver								
MISSOURI RIVER	BASIN - WYOM	ING		-				
Shoshone Riv		440.00	147.8	154.8	202.3	269.1	280.9	
Wind Riv	Boysen	758.00	382.1	495.0	152.4		New	
Wind Riv	Pilot Butte	31.6	17.7	23.5	13.6	13.8	16.9	
Bull Creek	Bull Lk	152.00	69 .3	56.0	61.2	79.5	59.9	
Belle Fourche	Key Hole	190.00	8.6	13.8	1.3	0.0	0.0	
MISSOURI RIVER	BASIN - NORTH	DAKOTA						
Hart River	Hart Butte	54.80	56.2	55.9		5-5	New	
Hart River	Dickerson	4.3	5.7	3.3			New	
MISSOURI RIVER	BASIN - SOUTH	DAKOTA		u de				
Belle Fourche	Belle Fourche	185.00	120.4	65.6	117 9	04 7	374 7	
Cheyenne River		92.00	32.7	11	117.8	94.3	134.3	
		92.00 15.1	15.1	50.6	41.0	0.0	0.0	
Cheyenne River Grand River	Shadehill	84.00	82.6	13.9	15.1	14.1	13.4	
Grand Kiver	Shadeniii	04.00	02.00	84.2	0.0	0.0	0.0	



STATUS OF RESERVOIR STORAGE APRIL 1, 1954

			THOUSAND ACRE FEET IN STORAGE							
BASIN &		USEABLE CAPACITY		MARCH 31						
STREAM	RESERVOIR	(M.A.F.)	1954	1953	1952	1951	10-yr avg 1942-51			
COLUMBIA RIVER	BASIN									
Flint Crk	Georgetown Lk	31.00	20.4	23.8	20.9	19.9	22.4			
Rock Crk	Como Lk	34.80	5.9	5.6	13.6	9.9	14.9			
S.Fk.Flathead	Hungry Horse	3,500.00	1,947.0	719.7	65.4		New			
Flathead Riv	Flathead Lk	1,791.00	616.1	641.0	572.3	651.6	593.2			
Little	Little		32302							
Bitterroot*	Bitterroot	36.10	19.5	30.8	36.1	35.7	16.0			
Dry Fork Crk**	Dry Fork	6.70	3.9	5.0	4.8	5.1	3.2			
Flathead Irr.										
Project***	Mission Valley	98.60	20.6	36.2	49.9	52.5	40.3			
Jocko Crk	Lwr Jock Lk	7.6	Sno Bnd	Snow E	Bound					
Clark Fork	Pend Oreille 1	Lk		343.6	337.7	449.2	381.4			

^{*} Sum of two reservoirs on Little Bitterroot

^{**} Sum of two reservoirs on Dry Fork Creek

^{***} Sum of (8) eight reservoirs on Project



MONTANA SNOW SURVEYS APRIL 1, 1954

					SNOW CO	VER ME	ASUREM	ent s	
MISSOURI BASIN				1954		Pa			
DRAINAGE BASIN			Date	Snow	Water	Water	Conten	t (In.)	Years
and			of	Depth	Content	-		1	of
SNOW COURSE	No.	Elev.	Survey	(In.)	(In.)	1953	1952	Average	Record
JEFFERSON RIVER									
(Rock-Beaverhead)									
Lakeview Ridge	11E3	7400	4/1	33	8.5	9.8	11.1	10.4	6
Lakeview Canyon	11E4	6930	4/1	40	8.7	10.4	14.6	11.8	6
Limekiln	12E2	6950	3/11	8	1.0	2.4	2.8	2.2	6
White Pine Rdg	12E1	8850	3/11	33	6.8	7.0	8.7	7.0	6
*Kilgore	11E12	6200				7.2	17.1	10.9	17
*Camp Creek	12E3	6800	3/28	35	10	10.6	23.7	9.9	18
*Blue Ldg Mine	11E11	6700	,			15.2	29.7	16.6	16
(Horse Prarie)									
Bloody Dick	13D10	7600	3/15	38	11.2	14.2	11.8	13.1	6
Gold Stone	13 D 9	8100	3/15	41	14.4	19.0	16.6	17.2	6
Lemhi Pass	13E1	7400	3/12	28	7.6	8.2	11.5	10.6	6
Terrell Creek	13D12	6650	3/12	14	4.6	5.1	5.0	4.9	6
Trail Creek	13 E 2	7090	3/12	30	9.0	8.1	8.8	9.3	6
Selway Junction	13D11	6800	3/12	32	9.2	11.0	9.8	9.9	6
(Big Hole)									
Big Hole Pass	13D3	7440	3/16	50	18.7	19.3	23.4	20.2	6
Big Hole Pass(B1)		6900	3/16	42	13.6	16.5	17.4	16.5	6
East Boundary	13 D 5	6700	3/16	23	7.2	10.3	9.6	10.1	6
Gibbons Pass	13 D 2	7100	3/30	69	24.6	28.0	32.4	23.8	15
Jahnke Creek	13D8	7340	3/15	39	12.2	14.4	13.3	12.7	6
Miner Forks	13 D 6	7300	3/14	44	13.6	14.4	14.4	13.6	6
Miner Lake	13D7	6720	3/14	32	9.8	9.6	9.9	8.7	9
*Moose Creek	13 D 16	6200	4/2	47	17.3	22.5	22.0	16.3	17
(Wise River)									
Anderson Meadow	13D14		3/18	28	8.0	8.6	11.2	9.3	6
Elk Horn	13 D 15		3/30	42	11.2	10.5	12.5	9.5	15
Wise River	13 D 13	6300	3/18	22	5.8	6.0	6.3	5.9	6
(Ruby River)			,	1					1
Cottonwood	11E2	5900	3/10	29	9.1	N.R.	13.2	10.5	5
Cottonwood (Up)	11E1	8400	3/10	31	9.4	N.R.		11.4	5
Flashlight	12 D 3	6950	3/31	28	7.8	7.4	6.2	5.8	9
Tobacco Root	12 D 2	6900	3/9	24	7.3	11.7	13.6	11.9	6
Vigilante	1101	6125	3/10	4	1.5	0.0	3.6	1.2	6

^{*} Adjacent Basin ** No Record



			SNOW COVER MEASUREMENTS									
MISSOURI BASIN				1954			t Reco					
DRAINAGE BASIN			Date	Snow	Water	Water C	ontent	; (In.)	Years			
and			of		Content				of			
SNOW COURSE	No.	Elev.	Survey	(In.)	(In.)	1953	1952	Average	Record			
MADION DIVID				-		 			•			
MADISON RIVER						1						
Hebgen	11 E 5	6550	3/27	38	12.0	12.2	19.6	12.6	18			
W. Yellowstone	11E7	6700	3/27	34	10.7	10.9	18.9	11.6	17			
21-Mile	11E6	7150	3/27	61	19.6	16.8	28.6	17.2	17			
*Big Springs	11 E 9	6500	3/29	64	24.7	21.7	34.7		18			
*Island Park	11510	3600	3/30	50	16.9	16.2	30.4		18			
*Valley View	11E8	6500	3/30	47	15.4	15.6	30.0	15.5	18			
Norris Basin	10E2	7500	3/30	37	11.6	N.R.**	12.7	9.4	15			
GALLATIN RIVER					- the							
Devil's \$lide	10D4	8100	3/30	65	20.0	18.8	27.5	20.3	15			
Hood Meadow	10D4	6600	3/30	33	8.8	7.6	13.7	8.7	15			
Mystic Lake	1003	6600	3/27	29	7.2	6.6	10.0	7.6	17			
New World	10D1	6700	3/27	34	8.8	9.8	13.1	10.2	15			
21-Mile	11 E 6	7150	3/27	61	19.6	16.8	28.6	1	17			
			-/									
MISSOURI RIVER MA			. /4	4.5	24.0	30.0	30.4	100	17			
Crystal Lake	901	6100	4/4	45	14.2	10.2	16.4		13 18			
Chessman Res	1205	6200	4/1	19	4.8	4.5	6.7	l .	13			
Crystal Lake	901	6100	4/4	45	14.2	10.2	16.4		16			
Grasshopper	1002	7000	3/31	25	6.8	4.4	8.4	1	1			
Kings Hill	1001	7950	3/29	47	14.0	11.6	17.0	13.3	15			
Picnic Grounds	1306	6500	4/1	19	5.2	N.R.*			8			
Pipestone Pass	12D1	7200	4/1	25	4.9	6.3	7.6	5.8	15			
Stemple Pass	1201	6900	3/30	46	13.2	10.4	13.4		15			
Tenmile, Lower	1202	6250	3/26	34	7.6	6.6	9.4	6.5	18			
Tenmile, Middle	1203	6800	3/26	45	11.0	11.6	3.0		18			
Tenmile, Upper	1204	8000	3/26	50	13.5	14.0	15.8	13 .4	18			
(Teton River)	7047	6000	3/26	73	25.3	21.4	18.1	19.2	6			
Fright Creek	12,11	6000					7.2	8.2	6			
Waldron Creek	12B2	5600	3/25	34 62	12.0	6.2	1		6			
West Fork	12B1	6000	3/20	02	24.8	20.6	19.6	15.5	-			
(Sun River)	1000	5500	3/24	48	17.5	7.5	11.6	10.9	6			
Benchmark	12B8	5500		1	1		8.2	1	5			
Cabin Creek	12B6	5400	4/6	41	11.9	1 (7.5				
5-Bull	12B9	5600	3/24	43	13.0	5.2	9.6		6			
Gates Park	12B5	5300	4/5	58	19.0		12.8		5			
Goat Mountain	12B7	7000	4/1	57	17.9	10.4	14.4		15			
Wrong Ridge	12B3	6800	4/3	91	33.0	20.8	21.2	1	5			
Wrong Creek	12B4	5700	4/4	73	25.4	11.7	15.6	16.1	5			
(Marias River)	3015	C0C0	2/23	0.0	20.0	10.0	90.7	17.0	10			
Marias Pass	13A5	5250	3/31	82	28.6	16.8	20.7	17.6	18			
(Milk River) Rocky Boy	9A1	5200	4/1	26	6.2	4.6	5.1	5.4	12			
	JAI	0200	7/1	20	064	100	0.1	0.1	10			
(Musselshell)	1002	7000	3/31	25	6.8	4.4	8.4	5.3	16			
Grasshopper Kings Hill	1002	7950	3/29	47	14.0	11.6	17.0					
-		o Recor		1	1100	1100	1 - 1 00	1 2000	1			
*Adjacent Basin	IA	o Recor	u									



			SNOW COVER MEASUREMENTS							
		1954			Pa					
		Date	Snow	Water	Water	Conten	t (In.)	Years		
		of		Content		1		of		
No.	Elev.	Survey	(In.)	(In.)	1953	1952	Average	Record		
				•						
		-				1				
9D1	7890	3/31	32	7.8	5.3	7.7	7.1	16		
10E3	7750	4/1	49	17.8	14.3	21.4	16.8	8		
10D7	7400		37	10.9	8.8	11.9	7.9	17		
10 D 5	8400		39	9.8	9.2	14.6	10.0	19		
10 D 6	8000		58	19.4	19.7	22.2	18.2	12		
10E4	7850			4	9.5		10.8	16		
9 E 1	8200			1	10.1		11.0	16		
10E1				i				15		
10E9								35		
				į.				35		
10E7	7900	4/1	84	28.0	21.1	29.6	25.1	7		
1003	6500	4/1	28	7.8	8-2	10-8	6-4	15		
				1	1)			16		
		0,02								
•										
10F2	9200	3/26	84	28.5	28.1	30 .2	24.9	18		
9 F 6	8800	3/27	58	16.5	14.8	12.6	17.6	5		
9F2	8750	3/26	38	9.9	8.2	7.6	10.1	13		
9 F 3	8500	3/27	38	9.9	7.5	9.5	10.2	5		
9F4	9500	3/27	70	20.1	18.7	19.2	22.3	5		
9F1	75 00	3/26	40	11.4	8.7	7.4	7.3	18		
	8000	3/28	38	9.5	7.0	7.9	7.4	13		
9F1	9600		103	34.7	27.3	32.2	28.8	18		
9710	10000	3/25	52	13.9	12.7	14.5	15.8	4		
					1		1	4		
					ři .		9	5		
		3/30			3		Į.	9		
				1				10		
					1			5		
		,			}			17		
					1			18		
					H .			18		
10F5		3/27	31	7.9	18	1				
	9D1 10E3 10D7 10D5 10D6 10E4 9E1 10E9 10E8 10E7 10C2 (Windon Da 10F2 9F6 9F2 9F3 9F1 9F1 9F1 9F1 9F9 9C2 9F11 9F12 10F5 10F5	9D1 7890 10E3 7750 10D7 7400 10D5 8400 10D6 8000 10E4 7850 9E1 8200 10E9 7000 10E8 7700 10E7 7900 10E7 7900 10F2 9200 9F6 8800 9F2 8750 9F3 8500 9F4 9500 9F1 7500 9F5 8000 9F1 9600 9F1 9600 9F1 10000 9F9 9500 9F1 9600 9F1 9000 9F1 9000 9F1 7900 9F1 7900 9F3 8500 9F1 9600	9D1 7890 3/31 10E3 7750 4/1 10D7 7400 3/28 10D5 8400 4/1 10D6 8000 3/25 10E4 7850 3/30 10E1 7300 3/30 10E9 7000 4/1 10E8 7700 4/1 10E7 7900 4/1 10E7 7900 4/1 10E7 7900 3/26 9F6 8800 3/27 9F2 8750 3/26 9F3 8500 3/27 9F4 9500 3/27 9F1 7500 3/26 9F5 8000 3/27 9F1 7500 3/26 9F5 8000 3/27 9F1 7500 3/26 9F5 8000 3/27 9F1 9600 9F10 10000 3/25 9F9 9500 3/25 9G2 10000 3/30 9G3 9500 3/30 9F11 9000 3/29 9G1 8400 3/30 9F12 7900 10F5 8500 10F3 8600	9D1 7890 3/31 32 10E3 7750 4/1 49 10D7 7400 3/28 37 10D5 8400 4/1 39 10D6 8000 3/25 58 10E4 7850 3/30 46 9E1 8200 3/31 43 10E1 7300 3/30 46 10E9 7000 4/1 143 10E8 7700 4/1 112 10E7 7900 4/1 84 10C3 6500 4/1 28 10C2 7000 3/31 25 (Wind River on Dam) 10F2 9200 3/26 84 9F6 8800 3/27 58 9F2 8750 3/26 38 9F3 8500 3/27 38 9F4 9500 3/27 70 9F1 7500 3/26 40 9F5 8000 3/28 38 9F1 9600 3/25 52 9F9 9500 3/25 33 9C2 10000 3/25 52 9F9 9500 3/25 33 9C2 10000 3/25 32 9F1 9600 3/29 34 9F12 7900 10F5 8500 10F3 8600	9D1 7890 3/31 32 7.8 10E3 7750 4/1 49 17.8 10D7 7400 3/28 37 10.9 10D5 8400 4/1 39 9.8 10D6 8000 3/25 58 19.4 10E4 7850 3/30 46 12.4 9E1 8200 3/31 43 12.7 10E1 7300 3/30 46 13.0 10E9 7000 4/1 143 52.3 10E8 7700 4/1 112 38.0 10E7 7900 4/1 84 28.0 10C3 6500 4/1 28 7.8 10C2 7000 3/31 25 6.8 (Wind River on Dam) 10F2 9200 3/26 84 28.5 9F6 8800 3/27 58 16.5 9F2 8750 3/26 38 9.9 9F4 9500 3/27 70 20.1 9F1 7500 3/26 40 11.4 9F5 8000 3/28 38 9.5 9F1 9600 3/25 52 13.9 9F1 9600 3/25 33 7.6 9F10 10000 3/25 52 13.9 9F9 9500 3/25 33 7.6 9F10 10000 3/25 32 7.6 9F10 10000 3/25 32 7.6 9F10 10000 3/25 33 7.6 9F10 10000 3/29 34 9.0 9F11 7900 10F5 8500 10F3 8600	9D1 7890 3/31 32 7.8 5.3 10D5 7750 4/1 49 17.8 14.3 10D7 7400 3/28 37 10.9 8.8 10D5 8400 4/1 39 9.8 9.2 10D6 8000 3/25 58 19.4 19.7 10E4 7850 3/30 46 12.4 9.5 9E1 8200 3/31 43 12.7 10.1 10E1 7300 4/1 143 52.3 45.1 10E9 7000 4/1 112 38.0 33.0 10E9 7000 4/1 112 38.0 33.0 10E7 7900 4/1 84 28.0 21.1 10C3 6500 4/1 84 28.0 21.1 10C3 6500 4/1 84 28.0 21.1 10C3 6500 3/27 58 16.5 14.8 9F2 8750 3/26 38 9.9 7.5 9F4 9500 3/27 70 20.1 18.7 9F1 7500 3/26 40 11.4 8.7 9F5 8000 3/28 38 9.5 7.0 9F1 9600 103 3/25 32 7.6 6.2 9F1 9600 3/29 3/20 3/20 3/20 3/20 3/20 3/20 3/20 3/20	9D1 7890 3/31 32 7.8 5.3 7.7 10E3 7750 4/1 49 17.8 14.3 21.4 10D7 7400 3/28 37 10.9 8.8 11.9 10D5 8400 4/1 39 9.8 9.2 14.6 10D6 8000 3/25 58 19.4 19.7 22.2 9E1 8200 3/31 43 12.7 10.1 13.0 10E1 7300 3/30 46 12.4 9.5 14.2 9E1 8200 3/31 43 12.7 10.1 13.0 10E9 7000 4/1 143 52.3 45.1 52.8 10E8 7700 4/1 112 38.0 33.0 41.3 10E7 7900 4/1 84 28.0 21.1 29.6 10C2 7000 3/31 25 6.8 4.4 8.4 (Wind River on Dam) 10F2 9200 3/26 84 28.5 28.1 30.2 9F6 8800 3/27 58 16.5 14.8 12.6 9F2 8750 3/26 38 9.9 8.2 7.6 9F3 8500 3/27 70 20.1 18.7 19.2 9F1 7500 3/26 40 11.4 8.7 7.4 9F5 8000 3/28 38 9.5 7.0 7.9 9F1 9600 3/25 52 13.9 12.7 14.5 9F9 9500 3/25 33 7.6 6.2 7.4 9F1 9600 3/25 33 7.6 6.2 7.4 9F2 10000 3/25 52 13.9 12.7 14.5 9F9 9500 3/25 33 7.6 6.2 7.4 9C2 10000 3/25 52 13.9 12.7 14.5 9F9 9500 3/25 33 7.6 6.2 7.4 9C2 10000 3/25 33 7.6 6.2 7.4 9C2 10000 3/29 34 9.0 5.9 10.5 9F1 9600 10F3 8600 10F3 8600 10F3 8600	9D1 7890 3/31 32 7.8 5.3 7.7 7.1 16.8 10D7 7400 3/28 37 10.9 8.8 11.9 7.9 10D5 8400 4/1 39 9.8 9.2 14.6 10.0 10D6 8000 3/25 58 19.4 19.7 22.2 18.2 10E3 7300 3/31 43 12.7 10.1 13.0 11.0 10E1 7300 3/30 46 12.4 9.5 14.2 10.8 10E9 7000 4/1 143 52.3 45.1 52.8 42.5 10E9 7000 4/1 112 38.0 33.0 41.3 31.4 10E7 7900 4/1 84 28.0 21.1 29.6 25.1 10C3 6500 10C2 7000 3/31 25 6.8 16.5 14.8 12.6 17.6 10C2 7000 3/31 25 6.8 16.5 14.8 12.6 17.6 10C3 6500 3/27 38 9.9 7.5 9.5 10.2 9F4 9500 3/27 38 9.9 7.5 9.5 10.2 9F4 9500 3/27 38 9.9 7.5 9.5 10.2 9F1 7500 3/26 40 11.4 8.7 7.4 7.3 9F5 8000 3/28 38 9.9 7.5 9.5 10.2 9F1 9600 3/28 38 9.5 7.0 7.9 7.4 9F1 9600 3/25 52 13.9 12.7 14.5 15.8 9F1 9600 3/25 33 7.6 6.2 7.4 8.4 9F1 9600 3/29 34 9.0 5.9 10.5 8.0 9F1 9000 10F5 8500 10F3 8600		

^{*} Adjacent Basin **No Record



					SNOW C	OVER ME			
MISSOURI BASIN				1954		Pa			
DRAINAGE BASIN			Date	Snow	Water		Conten	t (In.)	Years
and SNOW COURSE	No.	Elev.	of Survey	Depth (In.)	Content (In.)	1953	1952	Average	of Record
LOWER YELLOWSTON	NE (Conf	tinued)							
POPO AGIE RIVER			-				lange control of the		
Blue Ridge	8 G2	9500	3/31	59	17.4	10.1	24.8	12.3	14
Grannier Meadow	8 G4	9000	3/31	70	20.8	12.1	22.9	12.9	17
Larsen Creek	9 G4	9000	4/1	40	10.4	6.5	12.8	14.0	4
Sawmill Glade	8 G1	8500	3/31	41	11.0	8.1	14.3	8.1	14
South Pass	8 G3	9000	3/31	71	21.8	12.3	23.1	14.4	14
Mulligan Park	9 G 5	8900	. /2			11.9	11.7	11.0	18
Dutch Joe	9 C 6	8700	4/1	41	11.9	8.0	11.0	8.4	15
BIG HORN RIVER -	- WYOMI	1 G							
Beavers Mill	9F8	8900	N.R.**			6.3	6.9	7.8	5
Owl Creek	8F1	8700	N.R.**			4.7	6.7	6.3	5
Timber Creek	9 E 2	8800	4/3	26	6.9	4.3	5.5	5.8	5
Wood River	9 E 7	8000	4/2	29	7.3	3.7	4.0	5.4	14
Tensleep R.S.	7 E 3	8200	3/31	30	5.5	6.9	10.0	7.1	17
Ranger Creek	7E1	8800	3/31	38	8.8	7.8	10.3	8.2	16
SHOSHONE RIVER									
Foot Potagoo	10 E 6	7000	4/1	1.0	72 1.	0.0	17 0	177	_
East Entrance Sylvan Pass	10E5	7100	4/1	49 54	13.4	8.9 13.5	13.8	13.3	5 16
TONGUE RIVER									
Burgess Jct.	7E4	7900	3/29	58	20.0	13.6	12.4	13.4	1
Big Goose	7E2	7700	3/29	24	5.5	4.3	5.0	4.3	18
Dome Lake	7 E 5	9000	3/29	44	11.0	7.2	N.R.*	* 6.8	3
POWDER RIVER			,						
	CE1	9500	7/55			4.0	0.0		3.5
Sour Dough North Powder	6 E1 7 E 8	8500 8500	3/31	39	9.0	4.6	6.8	5.9	17
Soldier Park	7£6	8700	3/30	33	7.0	5.8	10.3	7.6	3
Muddy Pass	7E7	9700	3/29 3/31	26 41	5.1 9.4	2.6 8.0	5.1 9.9	4.5 8.6	4
CHEYENNE RIVER -			-,					-	
			3/29	27	8.1	0.0	10.0		10
Upper Spearfish	1SD	6500	3/28	21	0.1	8.6	10.2	7.2	10
Upper Castle Deerfield						Aban	d one d		

^{*} Adjacent Basin ** No Record



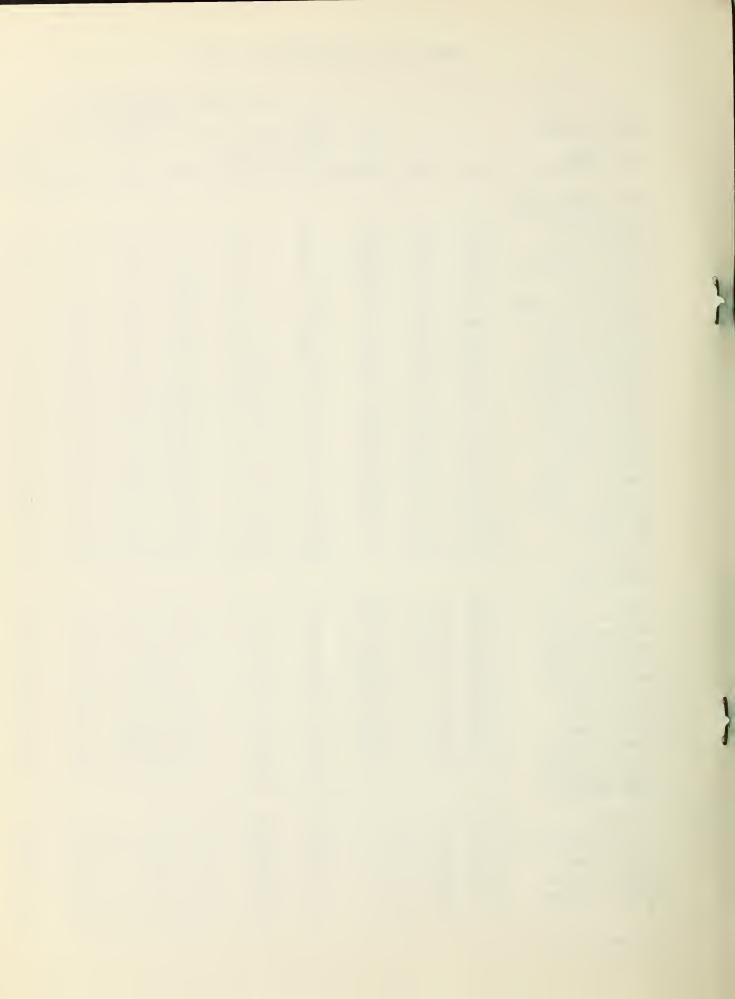
					SNOW CO		ASUREM st Rec		
COLUMBIA BASIN				1954					
DRAINAGE BASIN			Date	Snow		Water	Conten	t (In.)	
and SNOW COURSE	No.	Elev.	of Survey	Depth (In.)	Content (In.)	1953	1952	Average	Record
- Chow Goods	1108	DIG V .	aur vey	(1110)	(1110)	1300	1302	21.101.480	10001
					,				i ĺ
KOOTENAI RIVER (e									de speciel de
	Montana)							4
Baree Mt.	13B1	6000	4/1	147	60.3	45.8	44.7	40.4	15
Brush Creek	14A4	5000	3/31	57	19.1	11.8	11.8	11.9	9
Fernie	Can.	3500	3/30	48	16.4	7.0	9.0	7.8	17
New Fernie	Can.	4100	3/30	69	23.8	13.7	14.6	15.0	3
Fernie Ridge	Can .	5600	,			25.2	24.1	24.6	2
Ferguson	Can.	3000	3/31	70	29.2	19.7	19.2	19.5	16
Kimberley	Can.	3800	3/31	39	12.1	5,0	7.3	5.4	16
Marble Canyon	Can.	5000	3/31	57	19.0	14.7	13.4	14.8	7
Nelson Creek	Can.	3050	3/31	58	23.0	17.7	17.6	14.0	16
Red Mt., Mont.	15A1	6000	3/30	74	26.8	20.0	18.2	18.5	15
Sinclair Pass	Can.	4500	3/31	38	10.3	4.3	5.4	4.9	17
Smith Creek	16A1	4800	3/31	139	60.2	53.4	44.0	42.7	15
Sullivan Mine	Can.	5100	4/1	56	19.3	14.1	16.3	15.9	8
Upper Elk River	Can.	4400	4/1	44	11.0	5.6	7.4	8.6	6
Gerrard	Can.	6000				15.9	16,2	14.3	19
Gray Creek	Can.	5100	3/31	74	22.5	16.8	19.1	20.5	6
Sandon	Can.	3500	3/31	49	18.9	15.2	12.0	11.1	16
Blue Bird	14,41	6800	4/1	122	54.0	40.2	40.4	36.2	15
Farron	Can.	4000	7 -			14.4	17.9	12-1	16
Glacier	Cane		4/3	109	39.3	NR**	NR**	22.2	14
FLATHEAD RIVER					3000				
Blue Bird	14,41	6800	4/1	122	54.0	40.2	40.4	36.2	15
Basin Creek	13B14	5900	3/30	44	16.0	7.0	11.1	9.1	3
Big Creek	13B3	6750	3/31	109	43.1	41.7	46.9	40.8	13
Brush Creek	14A4	5000	3/31	57	19.1	11.8	11.8	11.9	9
Cattle Queen	13A1	4700	Esti		42.5	33.2	32.5		15
Coyote Hill	13B11	4200	4/1	39	13.2	11.7	14.9	11.2	7
Desert Mountain	13A2	5600	3/26	51	18.3	13.5	18.2	15.3	15
Goat Mountain	12B7	7000	4/1	57	17.9	10.4	14.4		15
Hell Roaring Divi		5700	4/5	102	37.9	29.2	34.3		12
Holbrook	14B13	4530	3/30	45	17.3	6.9	11.5	29.9 8.7	
Kishenehn #2	14A2	4300	4/2	56	15.2	6.0	7.2	7.7	3
Kishenehn #3	14A6	4000	$\frac{4}{2}$	67	1	N.R.**	N D	1	8
			4/1		18.3	None		N.R.	0
Logan Creek	14A5	4300		41	11.8	6.3	8.4	7.9	15
Marias Pass	13.45	5250	3/31	82	28.6	16.8	20.7	17.6	18
N.Frk. Jocko	13B7	6330	4/1	130	49.0	42.7	44.2	40.9	13
Quintonkon	13A13	3800	3/31	56	16.6	11.1	18.6	15.1	3
Spotted Bear Mt.	13B2	7000	3/30	54	16.8	10.2	16.0	15.8	6
Strawberry Lake	13B10	6500	4/1	104	37.8	33.1	53.6	46.5	6
Trinkus Lake	13B1	6500	4/1	120	37.9	36.3	43.3	45.0	6
Trout Lake	13A12	3600	3/28	60	18.9	13.1	17.4	18.7	6
Twin Creeks	13B11	3580	3/29	44	12.5	6.5	13.1	9.7	3
Upper Holland	13B5	7000	3/31	103	39.2	35.5	36.3	39.3	5

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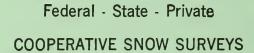


	No. Elev.	SNOW COVER MEASUREMENTS							
COLUMBIA BASIN		1954			Past Record			↑	
DRAINAGE BASIN			Date of Survey	Snow Depth (In.)	Water Content (In.)	Water Content (In.)			Years
and SNOW COURSE		Elev.				1953	1952	Average	of Record
Olivii Occilor	100	D10 4 9	Dai voy	(1110)	(1110)	1300	1300	11101450	10001
UPPER CLARK FORK									
Coyote Hill	13B11	4200	4/1	39	13.2	11.7	14.9	11.2	7
Chessman Res.	12C5	6200	4/1	19	4.8	4.5	6.7	4.8	18
East Fork R.S.	13 D 1	5400	3/31	22	7.0	8.3	10.3	5.7	15
Fish Lake, Idaho	15C2	5000	3/30	117	38.3	42 04			1
Intergaard	13C4	6450	4/1	31	8.3	N.R.**	9.0	8.4	8
Lubrecht Forest#6	1308	5400	4/1	15	4.1	1.4	5.9	3.6	3
N.Frk. Jocko	13B7	6330	4/1	130	49.0	42.7	44.2	40.9	13
Picnic Grounds	1306	65 00	4/1	19	5.2	N.R.**	6.0	4.4	8
Pipestone Pass	12D1	7200	4/1	25	4.9	6.3	7.6	5.8	15
Skalkaho Summit	13C.3	7258	3/29	85	32.8	26.5	26.6	25.2	15
Slide Rock Mt.	13C2	7100	4/1	54	17.9	15.1	15.5	14.0	17
Southern Cross	13C5	6500	4/1	24	8.0	N.R**	9.1	5.5	8
Stemple Pass	13C1	6900	3/30	46	13.7	10.4	13.4	9.8	15
Storm Lake #2	1207	7780	3/28	50	14.8	17.0	20.5	14.8	15
Stuart Mill	13 C 6	6500	4/1	26	7.6	N.R.**	11.2	7.3	8
Stuart Mt.#1	13C1	7400	3/30	86	34.0	27 .4	36.8	29.8	17
Tenmile, Lower	1202	6250	3/26	34	7.6	6.6	9.4	6.5	18
Tenmile, Middle	12C3	6800	3/26	45	11.0	11.6	13.0	10.6	18
Tenmile, Upper	12C4	8000	3/26	50	13.5	14.0	15.8	13.4	18
*49 Meadows	15B10	5000	4/1	123	46.0	36.3	40.7	35 .0	17
*Lookout	15B2	5250	4/1	136	50.5	33.1	39.6	33.4	17
BITTERROOT						Ì			
East Fork R.S.	13D1	5400	3/31	22	7.0	8.3	10.3	5.7	16
Gibbons Pass	13D2	7100	3/30	69	24.6	28.0	32.4		15
Nezperce Pass	14D1	6575	4/1	53	19.6	19.6		23.8	15
Nezperce Camp	14D2	5580	3/31	44	14.6	15.8	24.6	17.7	17
Skalkaho Summit	13C3	7259	3/29	85	32.8	26.5	18.7	13.6	17
Stuart Mt. #1	1301	7400	3/30	86			26.6	25.2	15
*Moose Creek	13D16	6200	4/2	47	34.0 17.3	27,4	36.8	29.8	17
*Kit Carson	14D3	4700	4/31	24	7.9	22.5	22.0	16.3	17
*Savage Pass	1404	6000	3/31	85	30.9	8.1	12.0 N.R.**	8.0	16
*Powell Pasture	15C3	3700	3/29	53	17.7	30.3	alea.	25.7	16
Packers Meadow	1402	5700	4/1	99	30,5	15.2	N.R.	13.4	15
Shanghai Pass	1105	0,00	3/30	72	30.5	21.7	25.2	21.7	17
PEND ORIELLE					3 3 3 3				
Baree Mt.	13B1	6000	4/1	147	60.3	45.8	44.7	40.4	15
Freeze-Out Summit	15C3	7000	4/2	139	46.9	36.2	37.9	1	15
Hoodoo Creek	1301	6200	4/1	173	69.0	48.1		31.9	17
Smith Creek	16A1	4800	3/31	139	60.2	53.4	49.2	46.6	17
Benton Springs	16A3	4900	4/1	64	25.1		44.0	42.7	15
Benton Meadows	16A2	2344	4/1	6	2.8	21.7	26.8	20.5	17
Bunchgrass Meadow	16A5	5000	4/1	85	33.6	0.1	7.1	2.1	17

^{*} Adjacent Basin ** No Record







Furnishes the basic data necessary for forecasting water supply for irrigation, domestic and municipal water supply, hydro-electric power generation, navigation, mining and industry

"WATER IS THE WEST'S GREATEST RESOURCE"